Air Quality and Climate Change: Vulnerabilities and Opportunities

Preparing for Sea Level Rise in the Bay Area

Local Government Forum

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Bay Area Air Quality Management District

Bay Area Air District Overview

- Jurisdiction over air quality in 9 Bay Area counties, including 101 cities
- Governed by a 22-member Board of Directors composed of elected officials from each county
- Regulatory authority over stationary sources
- Grants and incentives to reduce mobile source emissions
- Approximately 170 million daily vehicles miles traveled

Climate Change
Projected Impacts in Bay Area

- Air quality is not the only reason for climate protection actions
  - Decreased snowpack
  - Increased wildfires
- One meter sea level rise in San Francisco Bay will adversely impact:
  - Airports
  - Freeways
  - Waste water treatment and other public facilities
  - Existing residential, commercial, and industrial areas

Source: BCDC 2006

Public Health Impacts

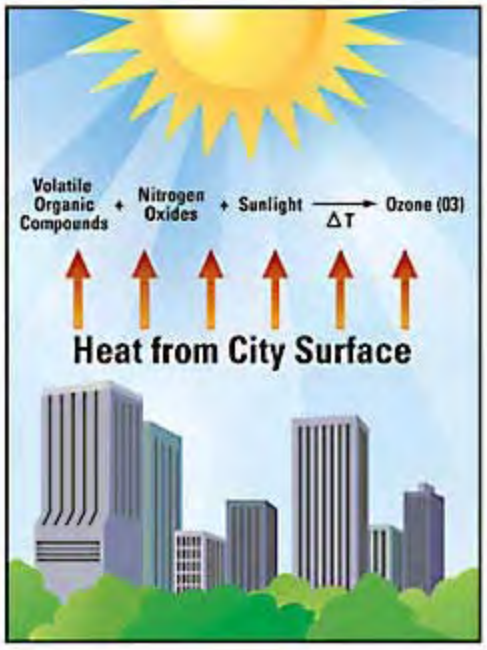
- Degraded air quality because of higher temperatures
  - Increases in ground-level ozone and other pollutants
  - Exacerbate respiratory illnesses (chronic obstructive pulmonary disease, asthma, allergic rhinitis, bronchitis)
  - Increases in premature mortality
  - Elderly, children, those with respiratory disease most affected
- Heat waves especially dangerous to the elderly and the poor
- Extreme weather such as drought and flooding
- Sea-level rise resulting in ecosystem and economic disruption
- Infectious diseases (e.g. Lyme disease, West Nile, malaria)

http://www.ornl.gov/info/news/pulse/califsnow_lg-htm.jpg; *Bay Conservation Development Commission*

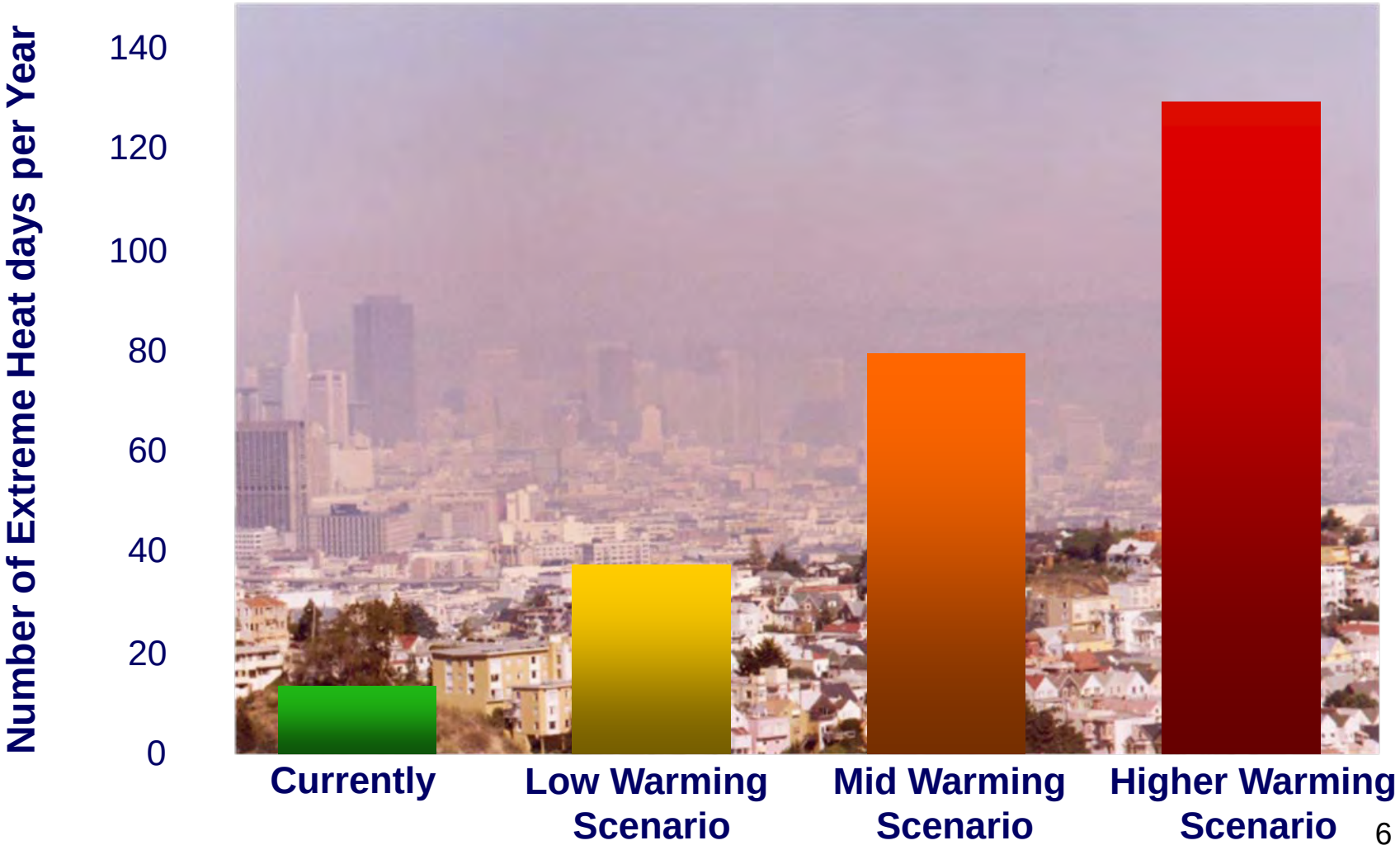
Air Quality Impacts: Bay Area

- Higher temperatures increase smog/ozone formation through
  - Increased emissions
  - Accelerated photochemical reactions

- Increases in ozone will occur in areas already experiencing high ozone levels
- Bay Area is sensitive to these changes because of our emissions characteristics and meteorology
- Increased temperatures could reverse years of air quality progress



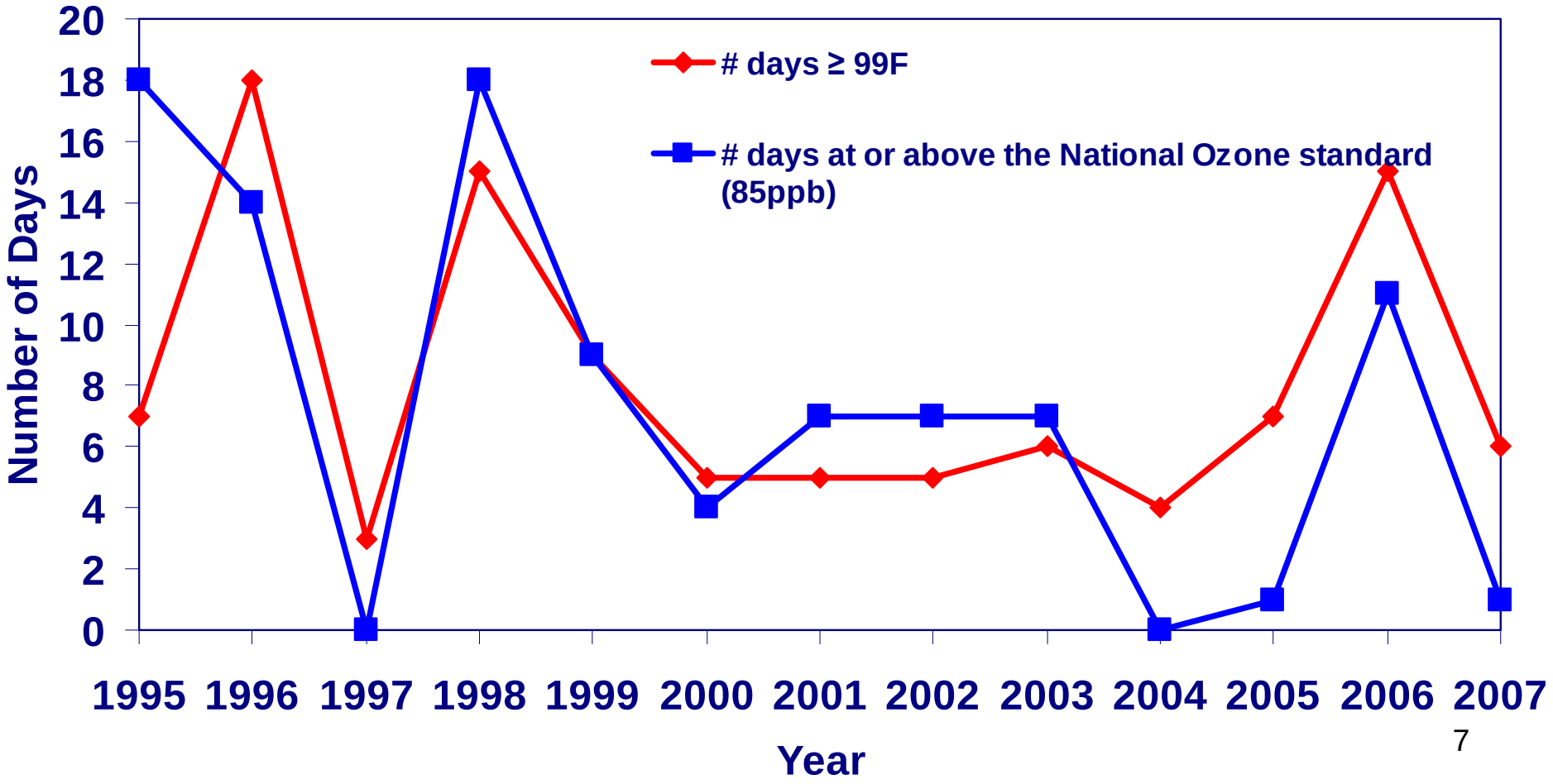
Climate Change Extreme Heat Days



Source: CEC 2006 Report "Our Changing Climate"

Bay Area Ozone and Maximum Temp Trends

Days at or above 99º F *and* Days Exceeding National 8hr Ozone Standard



Modeling Ozone and Climate Change

Projected ozone Increases due to:

- Temperature increases
- Increased reaction rates

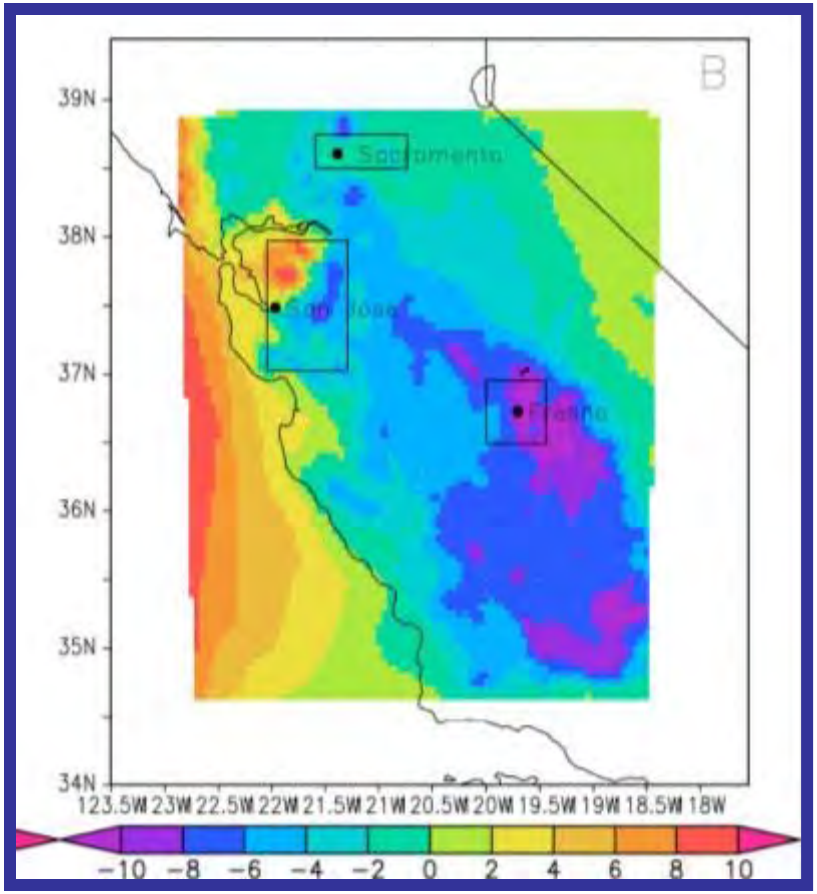
  (approx. 3% increase in O_3 levels)
- Enhanced biogenic emissions

  (approx. 4% increase in O_3 levels)
- Emissions controls and population growth by 2050 *(approx. 13% decrease in O_3 levels)*
- Changes in background emissions by 2050

  (approx. 6% increase in O3 levels)

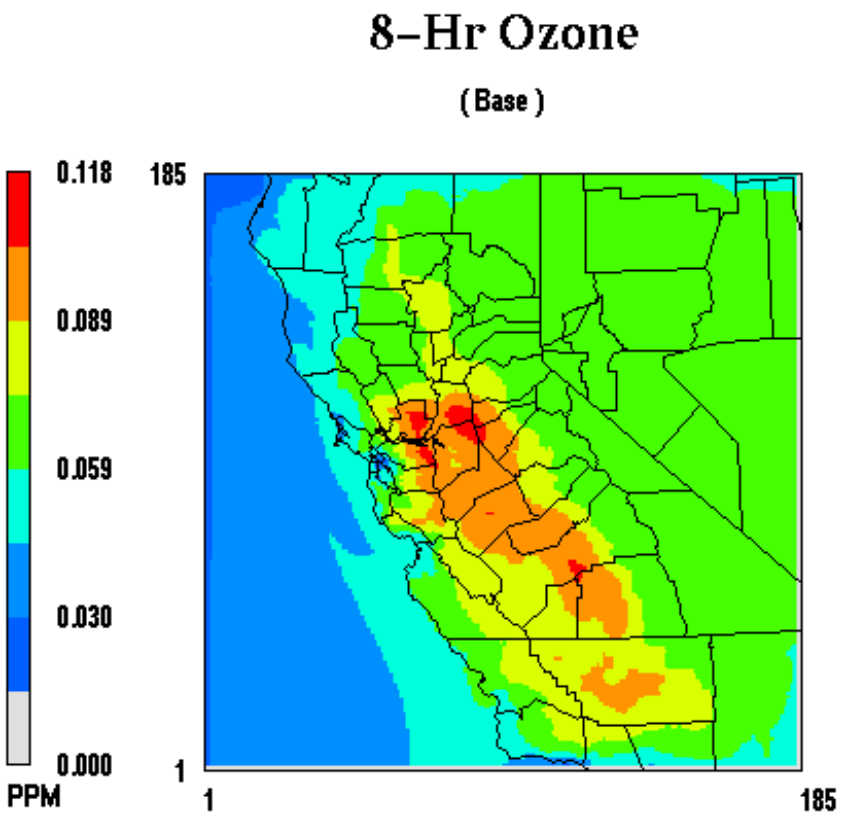
Conclusion:

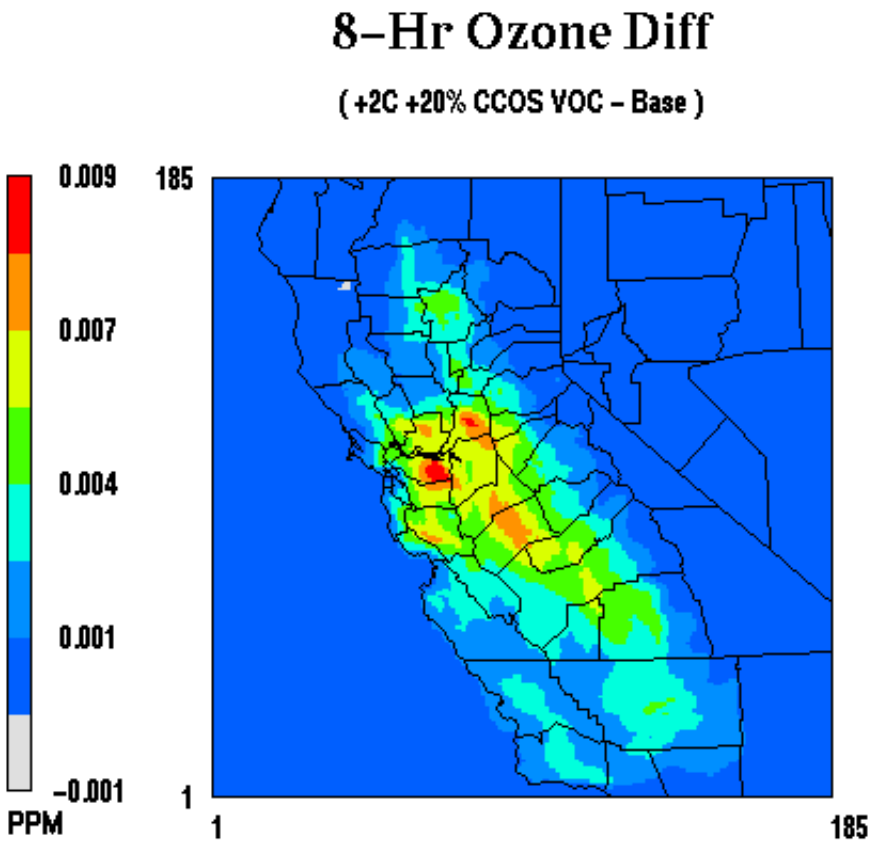
Other regions experience a decline in ozone, while Bay Area experiences an increase



Source: Dr. Robert Harley, UC Berkeley, 2008

Modeling Ozone and Climate Change





- Base: CCOS base case simulation for July 31-August 2, 2000
- Base + 2C temperature + 20% bio VOC increases

Source: BAAQMD, 2008

Air District Climate Protection Program Major Strategies

- **Integration**
  - Stationary source opportunities
  - CEQA comment process
  - Regional GHG Inventory
  - Business processes
- **Educate and Catalyze**
  - Dedicated Grant Program
  - Local Government Assistance
  - Curriculum Education and Public Outreach
- **Collaboration**
  - AB 32, ARB
  - Joint Policy Committee (ABAG, MTC, BCDC, BAAQMD)
  - AG - Conoco Phillips

Integration: Core Initiatives

GHG Mitigation Study

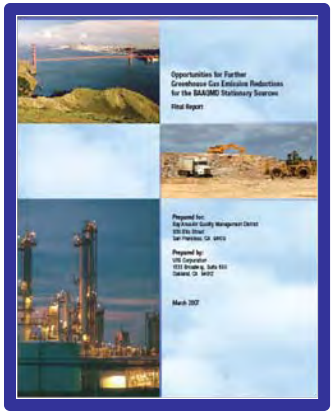
- Phase I, opportunities for further GHG reductions at stationary sources
- Phase II, landfills, boilers, process heaters, steam generators

Regulations

- GHG reductions in existing rules, e.g. Reg. 9-7: Boilers, Process Heaters, and Steam Generators
- Potential new rules, e.g. energy audits at commercial and institutional facilities

Stationary Source GHG Fee Schedule

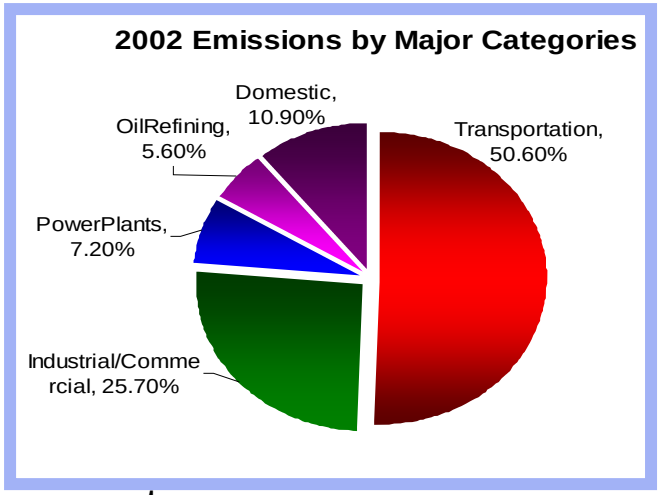
- Apply to permitted sources
- Cost recovery



Integration: Core Initiatives

Regional Greenhouse Gas Inventory

- Based on criteria pollutant inventory
- Total 85.4 Million Metric Tons of GHG
- Update to 2005 base year

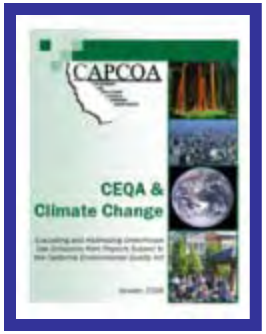


CEQA White Paper

- Developed in collaboration with CAPCOA
- Resource for addressing GHGs in CEQA documents

Update District CEQA Guidelines to Address GHG

- Guidance to Bay Area lead agencies
- CAPCOA CEQA White paper as starting point

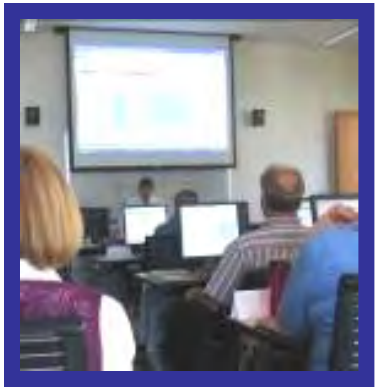


Educate & Catalyze: Core Initiatives

$3 Million in Grants Awarded

- 53 grants awarded throughout 9 counties
- Innovative and self-sustaining concepts
- Considering second round of funding
- Long-term consideration:

  Foundation or Foundation Partnership



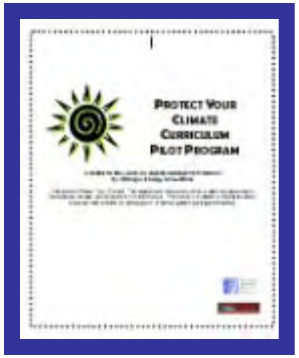
Local Government Assistance

- Workshops for local government staff
- Local GHG reductions plans and programs
- Best Practice Internet Portal partnership with Institute for Local Government

Educate & Catalyze: Core Initiatives

4th and 5th Grade Curriculum

- 16 science-based lessons
- Teacher training and materials tool kit
- 2007-2008 Pilot in 13 classrooms in 5 counties
- 2008-2009 Expand to 40 classrooms in 9 counties



Public Education

- Incorporating climate protection message into Spare the Air campaign
- Exploring education partnerships with regional agencies

Collaboration: Core Initiatives

AB 32 Implementation / CAPCOA

- Participating in Scoping Plan meetings
- CAPCOA Climate Protection Committee

Regional Partnerships

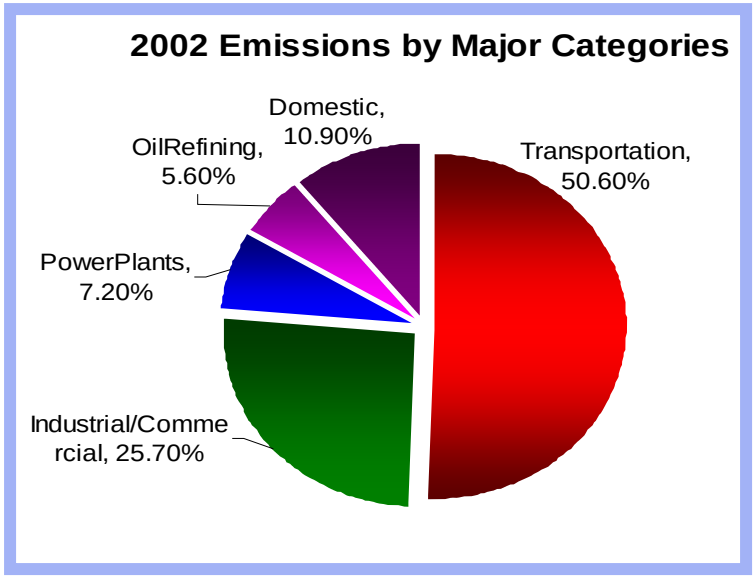
- Bay Area Climate Protection Summit
- Participation in Joint Policy Committee (MTC, ABAG, BCDC, BAAQMD)

AG / Conoco Phillips

- Landmark settlement: $7M Offset Program

Land Use and Transportation Climate Connection

- Transportation contributes 50% of GHG emissions in the Bay Area
- Transportation emissions driven by:
  - Land use patterns
  - Fuel and vehicle technology
- VMT projected to increase
- Land use choices today will determine future GHG emission levels



Local leadership can have resounding effect on climate protection…

Transportation Challenges and Opportunities

- Goods Movement
  - By 2020, cargo movement at California's ports is expected to triple from 2005 levels
  - Emissions from heavy duty vehicles are 20% of California CO2e emissions from transportation
  - ARB regulations to reduce diesel PM emissions
  - BAAQMD Green Ports Initiative underway
- Fuels and Technology
  - Pavley regulations
  - Low Carbon Fuel Standard

Further Opportunities

- Strengthen and expand partnerships
- Pursue synergies & co-benefits: integrate efforts to reduce both GHG and ozone precursors
- Smart growth: FOCUS
- Integrated planning: CEQA, general plan guidelines
- Green contracting
- Water conservation and energy efficiency
- Green building → Cool buildings
- Mitigating Urban Heat Islands
  - Tree planting
  - Cool surfaces, streets, roofs, communities